Radar Interferometry Satellite Mission Concepts for Earth Change and Hazards observations

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Differential repeat orbit radar interferometry is gaining acceptance as a potentially powerful tool for detecting, and monitoring millimeter-scale surface displacements of Earth's crust over wide areas. Demonstrations of the technique, including measurement of co-seismic and pos[-seismic earthquake displacements, volcanic deflation and surface change, and ice sheet and glacier velocities, have used ERS- 1, JERS - 1, and SIR-C radar data, defining the limitations of existing satellite capabilities. Based on these results, it is possible to conceive a mission dedicated 10 global change and hazard monitoring that embraces several key principles: 1) Global accessibility to Earth's land surface to respond to unpredictable hazards, 2) Minimum orbital repeat period for rapid disaster response and monitoring of fast glaciers 3) High coherence measurements of any given area made frequently over lime, and from multiple look directions, to assemble vector change maps over the Earth, 4) rapid, efficient, and inexpensive global distribution of radar data to the science community. An 1 Earth Change and 1 lazard observatory (ECI 10) has been designed to meet these requirements. The talk will describe the mission concept and discuss the trade-offs in science, functionality, and cost addressed in the design process that led to ECHO over other mission concepts,